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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,641	12/16/2003	Shorin Kyo	Q78967	3524

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EXAMINER	
SHIKHMAN, MAX	
ART UNIT	**PAPER NUMBER**
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/735,641	KYO, SHORIN	
	Examiner	Art Unit	
	Max Shikhman	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-9,11* is/are rejected.

7)☒ Claim(s) *2,4,10 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/16/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. **Claims 1-12** are objected to because of the following informalities:

In **Claims 1, 5** and **9**, it is unclear what is meant by, "*multiplies kernel coefficients of the right side column or the left side column for the center column*". It is incorrect to say, "multiply A for B". Examiner interprets "for" to mean --or--.

In **Claims 1, 5** and **9**, remove brackets by replacing "*(N and M are odd numbers being 3 or more integers)*" with --, N and M are odd numbers being 3 or more integers--.

In **Claim 1**, last line, "*memorizing in said memorizing means*" should be replaced with --*memorized in said memorizing means*--.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. **Claims 5-8** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

In **Claims 5-8**, "*A program for making a computer work*" is being recited; however, "*A program for making a computer work*" would reasonably be interpreted by one of ordinary skill in the art as software, per se. This subject matter is not limited to that which falls within a statutory category of invention because it is limited to a process, machine, manufacture, or a composition of matter. Software is a function descriptive material and a function descriptive material is non-statutory subject matter.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1, 5, 9** are rejected under 35 U.S.C. 102(b) as being unpatentable by Gonzalez, "Digital Image Processing, 2/E" (ISBN-10: 0201180758. Published: 11/09/2001). Gonzalez discloses as follows.

() **Regarding Claim 1**:

A symmetric type image filter processing apparatus, which processes image data by a symmetric type image filter composed of N.times.M kernel coefficients (N and M are odd numbers being 3 or more integers), comprising:

(Gonzalez, Page 117, Figure 3.32 and formula (3.5-1) show a mask **w** operating on the image f(x,y). Figure 3.32 shows a 3x3 mask. The mask can be symmetric by equating the left column to the right column, w(-1,-1)=w(-1,1) etc.)

an operating means that multiplies kernel coefficients of the right side column or the left side column or the center column by column elements of image data corresponding to said right side column or said left side column and

(Page 117, Formula (3.5-1) can clearly do this, w(s,t)*f(x+s,y+t) can implement corresponding column multiplication by letting t=constant.)

cumulatively adds the multiplied results;

(Formula (3.5-1), $\sum\sum$ adds the multiplied results.)

a memorizing means that memorizes operation results being multiplied and cumulatively added results operated at said operating means as intermediate data; and

(Page 117, Formula (3.5-1) involves many multiplications and additions, which are stored in computer memory as intermediate data.
Formula (3.5-1) is meant to be implemented in Matlab or Fortran, "Digital Image Processing" is done in a computer, so the intermediate results are memorized.)

a pixel value calculating means that calculates pixel values of said image data by cumulatively adding said intermediate data memorizing in said memorizing means.

(Formula (3.5-1), g(x,y) matrix is initially all zeroes, adds to itself pixel values of a filtered image.)

() **Regarding Claim 5**:

A program for making a computer work to

(Formula (3.5-1) is meant to be implemented in Matlab or Fortran, "Digital Image Processing" is done in a computer, so the intermediate results are memorized.)

execute filter processing to image data by using a symmetric type image filter composed of N.times.M kernel coefficients (N and M are odd numbers being 3 or more integers), comprising:

(Gonzalez, Page 117, Figure 3.32 and formula (3.5-1) show a mask **w** operating on the image f(x,y). Figure 3.32 shows a 3x3 mask. The mask can be symmetric by equating the left column to the right column, w(-1,-1)=w(-1,1) etc.)

an operating step that multiplies kernel coefficients of the right side column or the left side column or the center column by column elements of image data corresponding to said right side column or said left side column and

(Formula (3.5-1) can clearly do this, w(s,t)*f(x+s,y+t) can implement corresponding column multiplication by letting t=constant.)

cumulatively adds the multiplied results;

(Formula (3.5-1), $\sum\sum$ adds the multiplied results.)

a memorizing step that memorizes operation results being multiplied and cumulatively added results operated at said operating step as intermediate data; and

(Page 117, Formula (3.5-1) involves many multiplications and additions, which are stored in computer memory as intermediate data. Formula (3.5-1) is meant to be implemented in Matlab

or Fortran, "Digital Image Processing" is done in a computer, so the intermediate results are memorized.)

a pixel value calculating step that calculates pixel values of said image data by cumulatively adding said intermediate data memorized at said memorizing step. (Formula (3.5-1), g(x,y) matrix is initially all zeroes, adds to itself pixel values of a filtered image.)

() **Regarding Claim 9**:

A method for processing image data by a symmetric type image filter composed of N.times.M kernel coefficients (N and M are odd numbers being 3 or more integers), comprising the steps of:

(Gonzalez, Page 117, Figure 3.32 and formula (3.5-1) show a mask **w** operating on the image f(x,y). Figure 3.32 shows a 3x3 mask. The mask can be symmetric by equating the left column to the right column, w(-1,-1)=w(-1,1) etc.)

multiplying kernel coefficients of the right side column or the left side column for the center column by column elements of image data corresponding to said right side column or said left side column and

(Formula (3.5-1) can clearly do this, w(s,t)*f(x+s,y+t) can implement corresponding column multiplication by letting t=constant.)

cumulatively adding the multiplied results as intermediate data;

(Formula (3.5-1), $\sum\sum$ adds the multiplied results as intermediate data.)

memorizing operation results being multiplied and cumulatively added results;

(Page 117, Formula (3.5-1) involves many multiplications and additions, which are stored in computer memory as intermediate data.

Formula (3.5-1) is meant to be implemented in Matlab or Fortran, "Digital Image Processing" is done in a computer, so the intermediate results are memorized.)

and calculating pixel values of said image data by cumulatively adding said intermediate data being memorized.

(Formula (3.5-1), g(x,y) matrix is initially all zeroes, adds to itself pixel values of a filtered image.)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 3, 7, 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzalez, "Digital Image Processing, 2/E" (ISBN-10: 0201180758. Published: 11/09/2001) in view of Hsu, "Two-dimensional discrete cosine transform using SIMD instructions" (US-PAT-NO: 6973469).

() **Regarding Claim 3**:

Gonzalez discloses all of the subject matter as described above except, *operating means and said pixel value calculating means execute the operation of said multiplication and said cumulative addition by using SIMD commands.*

Hsu discloses as follows. (Column 2, lines 7-14), "For example, many processors now support single-instruction multiple-data (SIMD) commands ... Advanced Micro Devices, has proposed and implemented 3DNow!, a set of floating point SIMD instructions...".

(Column 2, lines 21-30) "SIMD commands are "vectored" instructions in which a single operation is performed on multiple data operands. Such instructions are very efficient for graphics and audio applications where simple operations are repeated..."
(Column 2, line 34) "Upon execution of a vectored multiply instruction..."
(Column 10, line 34-38) "Values from two columns are being processed in parallel by the multiplication, addition, and subtraction operations."

As Hsu discloses, it is efficient to implement repetitive instructions with SIMD commands; many processors support SIMD. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to add Hsu's method to Gonzalez's method, to use SIMD commands for multiplication and addition. This would allow the implementation of Gonzalez's method on an SIMD AMD processor, AMD-K6.RTM.-2, efficiently.

() **Regarding Claim 7**:

Gonzalez discloses all of the subject matter as described above except, *operating step and said pixel value calculating step execute the operation of said multiplication and said cumulative addition by using SIMD commands.*

Hsu discloses as follows. (Column 2, lines 7-14), "For example, many processors now support single-instruction multiple-data (SIMD) commands ... Advanced Micro Devices, has proposed and implemented 3DNow!, a set of floating point SIMD instructions...".
(Column 2, lines 21-30) "SIMD commands are "vectored" instructions in which a single operation is performed on multiple data operands. Such instructions are very efficient for graphics and audio applications where simple operations are repeated..."
(Column 2, line 34) "Upon execution of a vectored multiply instruction..."
(Column 10, line 34-38) "Values from two columns are being processed in parallel by the multiplication, addition, and subtraction operations."

As Hsu discloses, it is efficient to implement repetitive instructions with SIMD commands; many processors support SIMD. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to add Hsu's method to Gonzalez's method, to use SIMD commands for multiplication and addition. This would allow the implementation of Gonzalez's method on an SIMD AMD processor, AMD-K6.RTM.-2, efficiently.

() **Regarding Claim 11**:

Gonzalez discloses all of the subject matter as described above except, *multiplying operation and said cumulatively adding operation and said pixel value calculating operation are executed by using SIMD commands.*

Hsu discloses as follows. (Column 2, lines 7-14), "For example, many processors now support single-instruction multiple-data (SIMD) commands ... Advanced Micro Devices, has proposed and implemented 3DNow!, a set of floating point SIMD instructions...".
(Column 2, lines 21-30) "SIMD commands are "vectored" instructions in which a single operation is performed on multiple data operands. Such instructions are very efficient for graphics and audio applications where simple operations are repeated..."
(Column 2, line 34) "Upon execution of a vectored multiply instruction..."
(Column 10, line 34-38) "Values from two columns are being processed in parallel by the multiplication, addition, and subtraction operations."

As Hsu discloses, it is efficient to implement repetitive instructions with SIMD commands; many processors support SIMD. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to add Hsu's method to Gonzalez's method, to use SIMD commands for multiplication and addition. This would allow the implementation of Gonzalez's method on an SIMD AMD processor, AMD-K6.RTM.-2, efficiently.

Allowable Subject Matter

8. **Claims 2, 4, 10, 12** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for allowable subject matter. Claims 2 and 10 would be allowable because the prior art does not disclose, "operating means multiplies said kernel coefficients of the right side column or the left side column by said column elements of said image data corresponding to said right side column or said left side column and cumulatively adds the multiplied results, and calculates intermediate data in one row of said image data, and said pixel value calculating means reads out said intermediate data corresponding to the position of each pixel of said image data, and calculates said pixel value by cumulatively adding said read out intermediate data" along with other limitations in the claim.

Claims 4 and 12 would be allowable because the prior art does not disclose, "the number of pixels in one row of said image data is P (P is a positive integer), and said operating means multiplies each kernel coefficient of M pieces in each column of [(N+1)/2] columns at said right or left side by each pixel of M pieces in the column direction of said image data and cumulatively adds the multiplied results, by using SIMD commands that are capable of processing data of sequential Q pieces simultaneously (Q>1 and Q is a positive integer

satisfying the condition P>Q), and executes this multiplying and cumulatively adding operation P/Q times, and generates said intermediate data in one row of said image data."

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kyo (PGPUB-DOCUMENT-NUMBER: 20040098709) discloses, "Method, apparatus, and computer program for generating SIMD instruction sequence".

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Max Shikhman whose telephone number is (571) 270-1669. The examiner can normally be reached on Monday-Friday 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Max Shikhman
4/16/2007

SHUWANG LIU
SUPERVISORY PATENT EXAMINER